Manitoba
Natural Resources

THE FIRST 5-YEAR REVIEW OF MANITOBA'S FOREST ROYALTY SYSTEM

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INTRODUCTION

This report documents the results of the first quinquennial review of Manitoba's timber royalty system which is commonly known as the stumpage system. The review proceeded in two phases: (i) the level of base stumpage rates which were first implemented in 1980 were reviewed and revised and; (ii) the relative rate levels between regions were re-examined. In addition, changes to certain procedures were considered and accepted. These changes will be documented in the final section of the report.

BACKGROUND

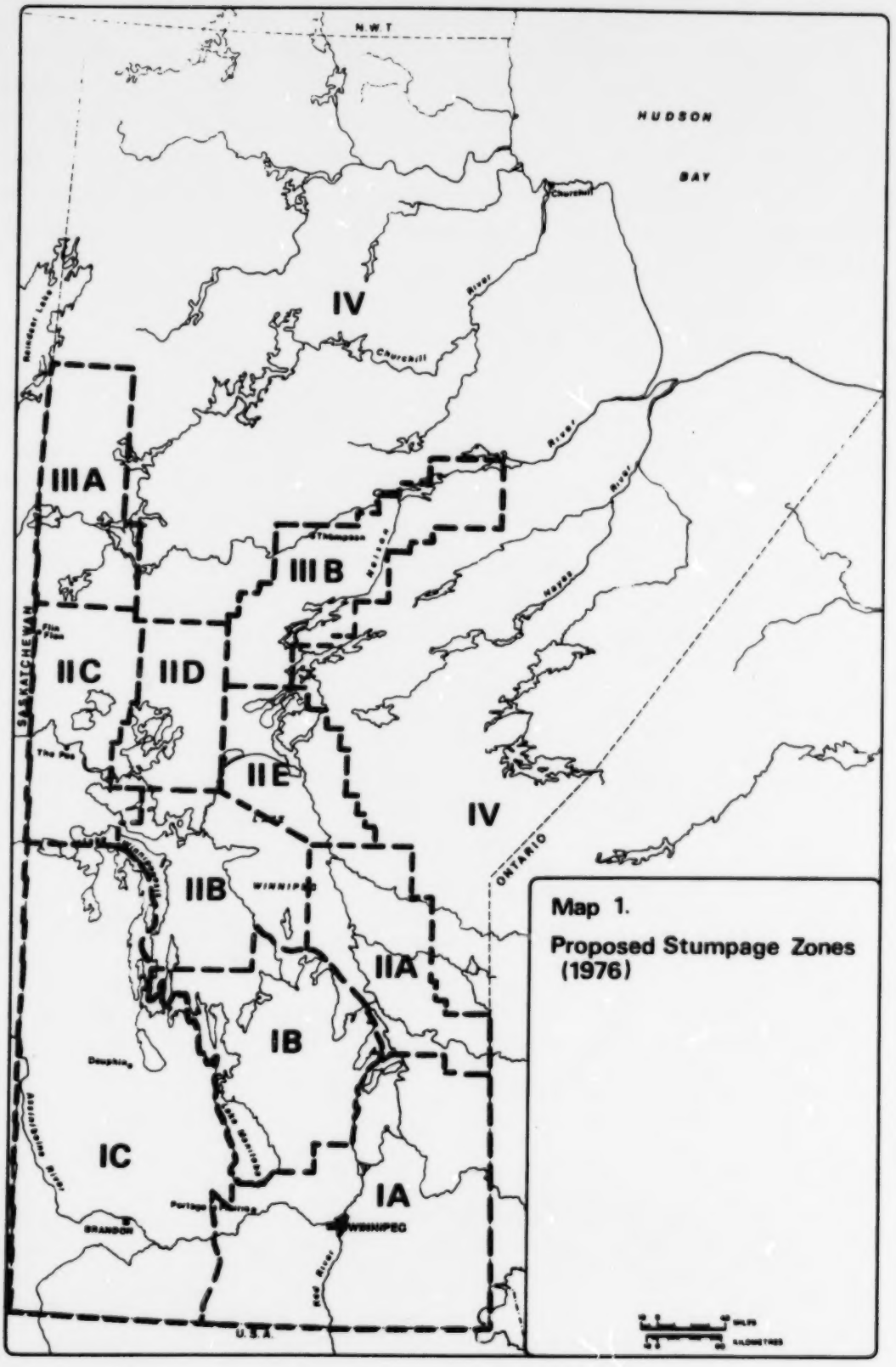
The stumpage system which was implemented on June 15, 1980, had its roots in a stumpage review conducted by the Planning Branch in 1975 and 1976. This earlier review was based on discussions with representatives of the forest industries. The Province's initial position was related to the average cost of forest management expenditures per unit of harvested timber. The cost base was calculated for fiscal 1974/75. (Note: fire management expenditures were included at 75% of their 5 year average). This worked out to $1.63 per cubic metre.

Provincial forested lands were then divided into eleven stumpage appraisal zones (see Map 1). Relative regional weights were then developed to reflect:

"a) The degree to which the region is already developed, i.e., the degree to which the potential annual allowable cut is being utilized, the degree to which infrastructure (i.e. roads, railways, etc.) is already in place, and distance to market.

b) The general level of economic development attained within the region, i.e., unemployment rates, income levels, etc." ([1])

([1])Draft Submission to Economic and Resource Development Sub-Committee of Cabinet by the Department of Renewable Resources and Transportation Services, 1976-08-24.



Map 1.

Proposed Stumpage Zones (1976)

It should be noted that a system of regional weights was designed to generate stumpage rates for each region. The average effective stumpage rate for all the regions was $1.63 per cubic metre (before the negotiated rates for Abitibi-Price and Manitoba Forestry Resources were considered). This meant that any adjustment to one or more regions had to be offset by changes to other regions of the same magnitude of total revenue.

After a second review of the province's stumpage system in 1979/80, it was decided to use the proposed rates from 1976 as the basis for 1980 rates. No adjustments were made to the 1976 rates to reflect the intervening inflation, nor changes in the department's average cost of forest management. However other changes were made, including:

(i) an allowance was made for the 4% trim allowance;
(ii) the number of stumpage zones was reduced from 11 to 7 with the new zones conforming to forest section boundaries (see Map 2);
(iii) the proposed 1976 rates were adjusted to reflect the fewer number of zones. This meant that regional weights and the relationship between jackpine pulpwood and other softwoods were not exactly as originally proposed;
(iv) rates were converted to metric equivalents.

These modified 1976 rates then became the basis for the stumpage rates currently in effect. They have been reviewed annually in the context of charges in the forest product price index.

PHASE ONE: THE BASE RATE REVIEW

The stumpage rate schedule implemented in 1980 and adjusted by the Forest Product Price Index (FPPI) had reached the levels documented in Table I during 1984. The overall increase in the FPPI, as reflected in Table I, has been 5.0% since 1980.

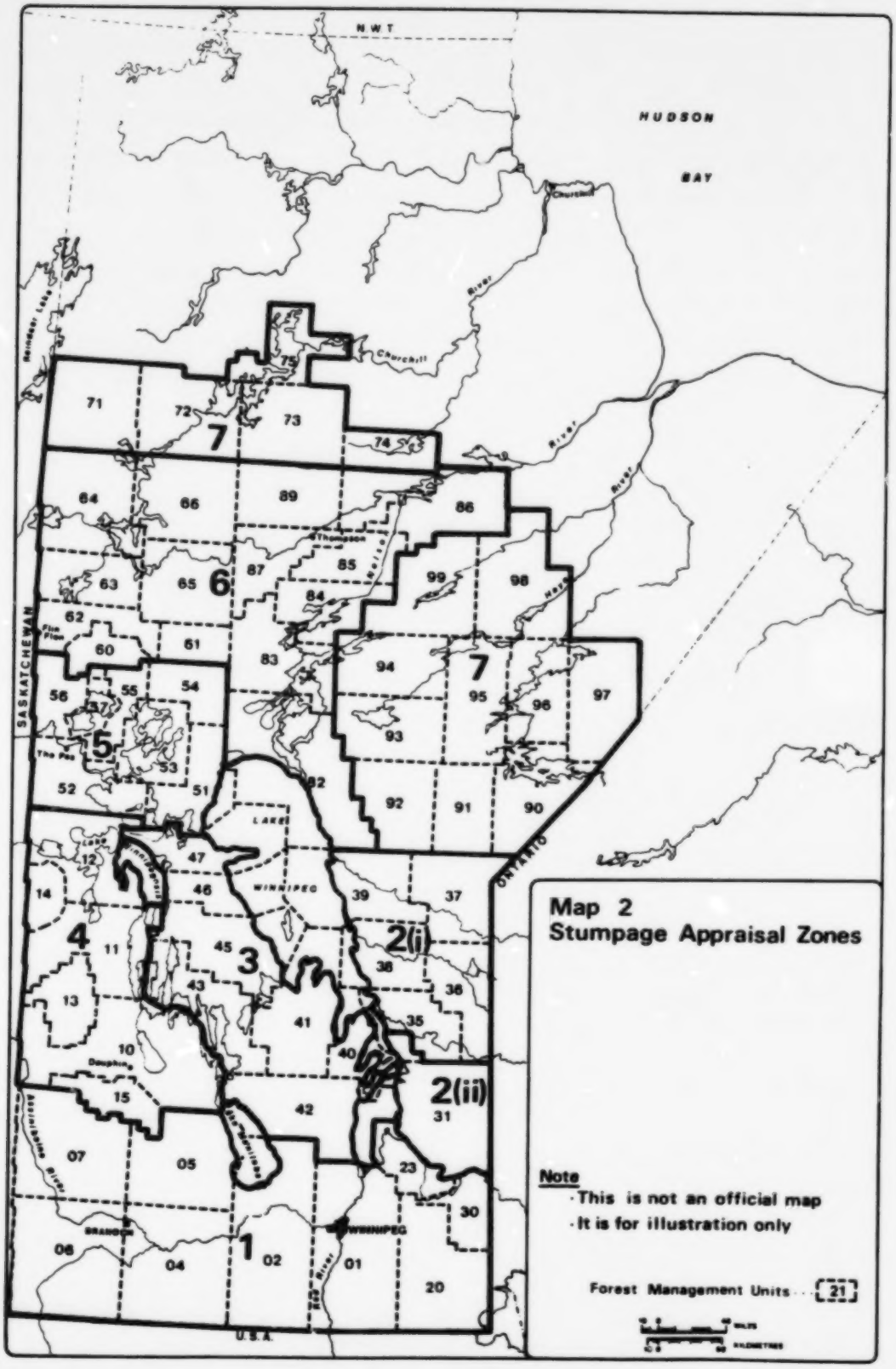

N.W.T.
HUDSON
BAY
SASKATCHEWAN
ONTARIO
U.S.A.
WINNIPEG
Churchill
Thompson
Dauphin
Brandon
Map 2
Stumpage Appraisal Zones
Note
·This is not an official map
·It is for illustration only
Forest Management Units 21

Table 1: Actual 1984 Stumpage Rates, $/m^3

Forest Section	Jackpine Pulpwood	Other Softwood	Hardwoods
1. Aspen - Parkland, Pineland and Whiteshell	1.25	1.80	0.40
2. Lake Winnipeg East			
(i) North of FML	0.95	1.05	0.40
(ii) FML and South	1.25	1.40	0.40
3. Interlake	0.85	1.35	0.40
4. Mountain	1.10	1.70	0.40
5. Saskatchewan River	0.80	1.50	0.35
6. Highrock, Nelson River	0.65	1.15	0.35
7. Churchill, Hayes River	0.20	0.40	0.35

Phase 1 of the first five year review resulted in a number of changes to the above rate schedule. Specific changes included:

1. the jackpine pulpwood category was eliminated;
2. the category for all hardwoods was eliminated;
3. a new category for aspen/poplar was created. Stumpage rates for this new category were identical to the previous hardwood category;
4. the 1985 FPPI adjustment was not applied;
5. the base year for subsequent FPPI adjustments was charged to 1983/84. Previously it had been 1979/80.

The need for a special rate for jackpine pulpwood had long been questioned and it was recognized that certain hardwood species commanded very good market prices. Except for aspen/poplar, which still remains in surplus on a provincial basis, the need for a special low rate for hardwoods is no longer warranted.

During 1984 and 1985 a proposal to introduce a forest maintenance surcharge has been given serious consideration. To ease the introduction of this charge, it was decided to forfeit the 1985 FPPI adjustment. This decision had the further effect of changing the base year for the FPPI from 1979/80 to 1983/84.(2)

Table 2: Revised Base Rates for 1985, $1/m^3$

Forest Section	Aspen/ Poplar	Other
1. Aspen - Parkland, Pineland and Whiteshell	0.40	1.80
2. Lake Winnipeg East		
(i) North of FML	0.40	1.05
(ii) FML and South	0.40	1.40
3. Interlake	0.40	1.35
4. Mountain	0.40	1.70
5. Saskatchewan River	0.35	1.50
6. Highrock, Nelson River	0.35	1.15
7. Churchill, Hayes River	0.30	0.40

The base rate structure, as revised during Phase 1 became effective October 1, 1985 and was published as Manitoba Regulation 212/85 in the Manitoba Gazette. Changes to the application of the FPPI will be implemented during subsequent annual reviews.

(2)The FPPI is described in detail in Application of the Forest Products Price Index.(DNR)

PHASE TWO: THE REGIONAL REVIEW

As shown in Map 2, the province has been divided into seven zones for stumpage purposes. Stumpage rates for each zone are derived on the basis of an index system which is responsive to a number of economic considerations. The regional rates have been calculated so that their weighted average ([3]) ensures that the targeted level of total revenue is generated.

The following discussion of Phase Two is rather detailed relative to the previous section. This was necessary for two reasons. First, the derivation of the regional indices (or weights) was not fully documented in 1980. Therefore this task had to be completed before the regional rates could be reviewed. Second, the review exercise was involved; it was necessary to detail this review to facilitate future reviews.

Effective Regional Weights

A set of explicit regional weights was not used to derive the 1980 stumpage rates. Instead the 11 zones created in 1976 were replaced by a 7 zone system. As a result, the implied regional weights must be derived from the actual stumpage rates adopted in 1980.

Stumpage Zone 1A from the 1976 proposal matches the Pineland Forest Section stumpage zone of the 1980 system. This area had been assigned a regional weight of 120 (i.e. 20% above the provincial average). Using this relationship and the actual harvest volume by forest section for the period 1970/71 to 1979/80 ([4]) effective 1980 regional weights are as follows:

([3])Weighted on the basis of each zone's actual softwood harvest. The weighted average during the last year of the review period was $\$1.45/m^3$.
([4])Source: Appendix 6 - Table 3. Manitoba Forest Management Plan, 1981-2000.

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Table 3: Effective Regional Weights, 1980

Forest Section	Effective Regional Weight
1. Aspen - Parkland, Pineland and Whiteshell	124
2. Lake Winnipeg East	
(i) North of PML	74
(ii) PML and South	100
3. Interlake	96
4. Mountain	118
5. Saskatchewan River	106
6. Highrock, Nelson River	81
7. Churchill, Hayes River	29
Provincial Average	100

Regional Factors

Two sets of factors will be given equal weight in the comparison of stumpage regions. The first factor is the pressure on the softwood annual allowable cut. As the local industry approaches total utilization of the available softwood, there will be greater pressure on the department to introduce forest management programs designed to maintain and/or increase available timber supply. These programs increase the department's average costs of forest management and fire protection. The second factor affecting relative regional weights are a number of related economic factors which contribute to each region's economic competitiveness. As there is a general relationship between the level of timber utilization within a zone and the degree of transportation infrastructures and proximity to market, these factors tend to re-inforce each other. Each of these factors is discussed below:

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Regional Timber Availability

From the perspective of forest management, it is desirable that the relative regional weights reflect the regional scarcity of timber. To obtain an estimate of regional timber scarcity the average harvest over 1970/71 to 1979/80 was compared to the total softwood annual allowable cut. Results are presented in Table 4.

Table 4: Harvest Pressure, by Stumpage Zone

	cubic metres		
Stumpage Zone	Average Harvest*	Softwood AAC*	Rate of Utilization
1	254,500	280,280	91%
2	262,834	1,035,240	25%
3	47,347	283,640	17%
4	333,226	340,040	98%
5	222,343	458,070	49%
6	532,499	1,976,730	27%
7	NIL	1,690,200	-

*Source: Manitoba Forest Management Plan, Appendix 6, Table 3, recalibrated to be consistent with Metrification of Forest Harvest Data (Economics and Program Review Section, 1984).

**Source: AAC Summary, Forest Management Plan Purposes, produced by Manitoba Forest Inventory Section, March, 1980.

It should be noted that the above table was calculated as if all timber harvested within each stumpage zone were softwoods. This would tend to overstate the softwood harvest, especially in Stumpage Zone 1. Nevertheless, on the basis of this cursory analysis, the greatest pressure on softwood reserves is in the Mountain Forest and Pineland Forest Sections. Each registers a rate of utilization in excess of 90%.

Next would come the Saskatchewan Forest Section with utilization approaching 50% of the annual allowable cut. At the very least it is expected that Lake Winnipeg East (FML and South) is comparable to Saskatchewan River in terms of utilization rates.

The Nelson River/Highrock stumpage zone has a rate of utilization in excess of 25% of the available softwood supply. The Interlake is relatively under developed with less than 20% of its softwood timber supply being harvested.

Finally, Lake Winnipeg East (North of the FML) and the Churchill River/Hayes River Forest Sections have a negligible harvesting rate.

Other Considerations

A number of other factors are also relevant to the development of regional weights. These will be discussed in this section.

Unemployment. The lowest regional unemployment rates occur in the southeast of the province. Next lowest would be the Western Region, followed by the Interlake. The north has the highest rate of unemployment. For further details see Manitoba Statistical Review, Unemployment Insurance Claimants and Claimant Rates, by Region, Manitoba.

Transportation Infrastructure. The Pineland and Mountain Forest Sections are perhaps the most favoured areas of externally financed road and rail transportation systems. The Interlake, Saskatchewan River and Lake Winnipeg East (FML and south) would come next, followed by the Highrock and Nelson River Forest Sections. Transportation infrastructure is undeveloped in the balance of the forested zone.

Distance to Market. Primary markets for Manitoba roundwood are Manitoba Forest Resources at The Pas, Abitibi-Price at Pine Falls and export markets (Wisconsin and Ontario). In addition, the Mountain Forest Section contains a

number of local manufacturers. On this basis Pineland, Lake Winnipeg East (FML and South) and Saskatchewan River all have the advantage. Mountain would rank next, followed by the Interlake, Nelson River and Highrock.

Revised Regional Weights

Ranking each region on the basis of an equal weight to (1) timber availability and (2) other considerations, the ranking presented in Table 5 is derived.

Table 5: Regional Rankings

Rank	Stumpage Zone
First	1, 4
Second	2 (ii), 5
Third	5
Fourth	3
Fifth	6
Sixth	2 (i)
Seventh	7

Setting the first ranked zone equal to 125 (which is the current maximum) and Saskatchewan River equal to 100, the regional weights, and stumpage schedule described in Table 6 is obtained.

Table 6: Proposed Regional Base Rates

	Proposed Weights	Existing Rates	Proposed Rates	Change
1. Aspen - Parkland, Pineland and Whiteshell	125	1.80	1.80	0
2. Lake Winnipeg East				
(i) North of FML	60	1.05	0.90	-.15
(ii) FML and South	110	1.40	1.60	+.20
3. Interlake	85	1.35	1.25	-.10
4. Mountain	125	1.70	1.80	+.10
5. Saskatchewan River	100	1.50	1.45	-.05
6. Highrock, Nelson River	75	1.15	1.10	-.05
7. Churchill, Hayes River	30	0.40	0.45	0

A detailed explanation of the derivation of the proposed weights used in Table 6, is included as the Appendix to this report.

Total stumpage collections (assuming all rates were applied to the entire industry) would remain the same. There is no increase in stumpage rates for the industry as a whole hidden in this new schedule; stumpage collections are simply redistributed across regions.

Rates would increase in the Mountain and Lake Winnipeg East (FML and South) Forest Sections; and decrease in the Interlake, Lake Winnipeg East (North), and Highrock/Nelson River Forest Sections. No change would occur in the Pineland and Churchill/Hayes River, and Saskatchewan River Forest Sections.

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PROCEDURAL CHANGES

During this review it became evident that it would be desirable to standardize certain aspects of the annual stumpage review, both from the point of view of the Forestry Branch and the industry. As such the following procedural guidelines will be updated:

1. Stumpage rates shall not be changed unless the review results in a change of a least a full $0.10 per cubic metre. This will minimize nuisance changes. (Note: this guideline applies only to the annual reviews and not to the 5-year base rate reviews.)

2. Statistics Canada has discontinued publication of the two industry price indexes which are used to derive the Forest Products Price Index. As a result:

   (i) the industrial product price index for Lumber, Sawmill and Other Wood Products (SIC 16) replaces the now discountinued industry selling price index for Sawmills and Planing Mills.

   (ii) the industrial product price index for Paper and Paper Products (SIC 18) replaces the now discountinued industry selling price index for Pulp and Paper Mills.

   The new indexes continue to be published by Statistics Canada in Industry Price Indexes (62 - 011). Also the procedures for calculating the annual FPPI remain the same as documented in Application of the Forest Products Price Index.

3. The industry shall be informed of the forecasted rates for the next year, by October 15th of each year.

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4. The industry shall be informed of the actual effective rate by January 15th of each year.

5. The rate shall become effective as of May 1st of the appropriate year.

To ensure that the industry receives timely notification of the forecast rate and the actual rate, the Forestry Branch shall create and distribute a Newsletter to the industry at the appropriate time of the year.

APPENDIX

Derivation of 1985 relative regional weights

DERIVATION OF 1985 REGIONAL WEIGHTS

The derivation of the regional weights presented in Table Four of the main body of the report is described in this appendix.

Four factors were explicitly considered for each of the seven stumpage zones. They were (1) timber availability as measured by the share of softwood AAC currently harvested, (2) regional unemployment rates as documented by Manitoba Bureau of Statistics, (3) the supply of externally financed transportation infrastructure as determined by casual inspection of the Manitoba highways map, and (4) distance to market, again based on casual inspection. It should be noted that a detailed quantitative study could have been made regarding the latter two items. Although this would have insured greater accuracy, it is the author's belief that the results would be neither timely nor cost efficient. Instead, it is felt that review of these rates by regional staff and by regional representation would be a more effective method of re-aligning regional weights.

The following decision rules were then adopted:

(1) timber availability was given 50% of the importance assigned to the 4 factors. The remaining 3 factors shared the remaining 50% equally.

(2) each region was assigned a score equal to its rank in each of the four categories. Where regions were tied, their combined ranks were equally divided between them. Thus each scoring should total to 36.

Scores are summarized in Table A-1.

(It should be noted that there are an infinite number of scoring systems available, some of which would result in significantly different regional rankings. A scoring system is desirable to ensure that the regional rankings do follow some objective criteria. The scoring system used to derive Table A-1 does

TABLE A-1

Stumpage Zone	(1) TIMBER AVAILABILITY	(2) OTHER CONSIDERATIONS Unemployment Rate	(3) Transportation	(4) Distance to Market	(5) Average**	TOTAL***	RANK
1	2	1	1 1/2	2	1 1/2	3 1/2	First
2 (i)	7	6 1/2	7 1/2	7 1/2	7 1/6	14 1/6	Fifth
(ii)	4	3 1/2	4	2	3 1/6	7 1/6	Second
3	5	3 1/2	4	5 1/2	4 1/3	9 1/3	Third
4	1	2	1 1/2	4	2 1/2	3 1/2	First
5	3	6 1/2	4	2	4 1/6	7 1/6	Second
6	6	6 1/2	6	5 1/2	6	12	Fourth
7	8	6 1/2	7 1/2	7 1/2	7 1/6	15 1/6	Sixth
TOTAL	36	36	36	36	36	72	

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* the ranking system follows the following rules:

(a) stumpage zones are ranked from best to worst in ascending order. Thus a score of 1 indicates the most favourable rank while a score of 8 indicates the poorest rank.

(b) where stumpage zones are tied, the ranks which they occupy is averaged. For example, if 2 zones are tied for the third and fourth ranks, they would be scored as 3 1/2 each.

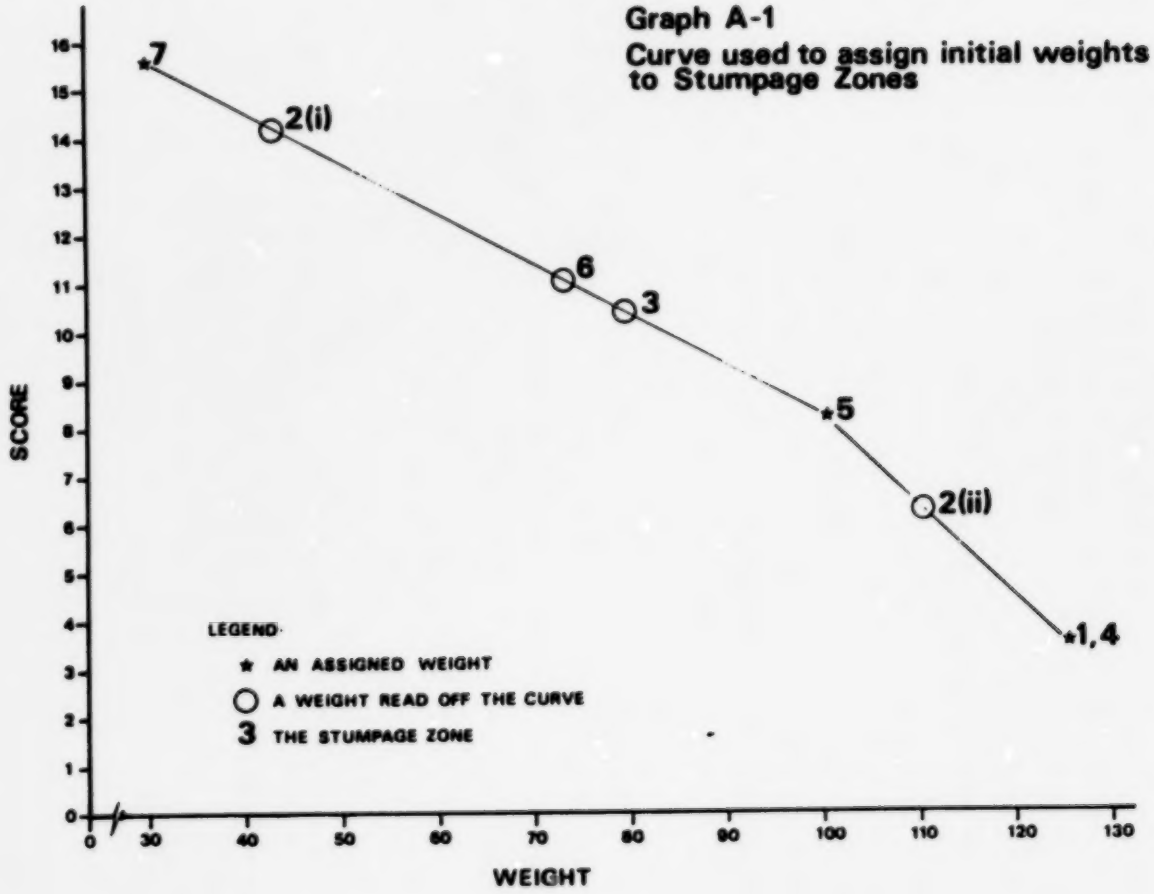
** average of columns (2), (3), and (4)

*** total of columns (1) and (5)

as reported in Table 5 of the main report

Graph A-1

Curve used to assign initial weights to Stumpage Zones



have the advantage of being simple, but the reader should appreciate the arbitrariness of the procedure).

Having derived the relative scores, the regions with the lowest scores (Stumpage Zone 1 and 4 were tied for this distinction) were assigned the highest regional weight in the existing system, i.e. 125%. Stumpage Zone 5 was then assigned a weight to make it equal to the provincial average stumpage rate, i.e. 100%. Stumpage Zone 7 retained its 30% weight.

The assigned score/regional weight combinations were plotted on Graph A-1. Initial readings for each of the unassigned stumpage zones were then taken. However, before actual weights could be assigned to these zones it was necessary to ensure that the weighted provincial average remained unchanged. Therefore a series of calculations and recalculations were made, given the assigned weights, until a subjectively acceptable series of weights for the remaining regions was generated. For this purpose, the distribution of the average harvest was needed. This would ensure that the provincial average rate was always maintained. Thus if rates were increased in one region, a corresponding decrease was needed for the remaining regions. The final weights, and resulting distribution of stumpage rates, which was recommended in the report, represents the final output of this process.